Impact of Trade Openness on Economic Growth of Pakistan: An ARDL Approach

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Abstract

This study examines the impact of trade openness on economic growth of Pakistan by employing autoregressive distributed lag (ARDL) approach over the period 1960-2011. Overall empirical results show that trade volume, investment and human capital have positive and significant impact on economic growth. Findings further reveal that trade restriction measures have negative and significant impact on economic growth in long run. Moreover, results show that the impact of trade openness on economic growth is not obvious in short run. The findings suggest that developing countries like Pakistan need to consider trade openness policy as a long term plan of the country. The policy direction of Pakistan should emphasize on more liberal policies to enhance economic growth which will eventually lead towards poverty reduction in Pakistan.

1. Introduction

Trade openness has been a prominent component of policy advice to developing countries for the last few decades. Trade openness is considered as important element of globalization which has been mostly described as the increasing interaction or integration of national economic systems with the help of growth in international trade and other socio-economic variables. It is connected with growing internationalization of production, marketing of goods and services, and the associated growing production and commercial activities. Trade openness involves the dismantling of all forms of tariff structures like import and export duties, quotas and tariffs and other restrictions to the free flow of goods and services across countries.

However the impact of the trade policy reforms[1] on economic growth is still debatable issue in developing economic in the last many decades. There are a number of empirical studies which examined the effects of trade openness on economic growth in developing countries by using range of econometric tools, but the empirical evidence is inconclusive. On one hand, most of the cross country studies supporting the strong link between trade openness and economic growth such as Dollar (1992), Sachs and Warner (1995), Edwards (1993, 1997, 1998), Levine and Raut (1997), Ben-David and Loewy (1998), Frankel and Romer (1999), Gwartney et al. (2000), Badinger (2001), Dollar and Kraay (2001) and Rutherford and Tarr (2003) and Winters (2003).

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[1] *For complete discussion about strategic trade policies issues see Krugman & Smith (1994) and Leamer (1988).*

On other hand, the empirical literature which show strong link between trade openness and growth has been critiqued for several reasons. Besides of any thing, the association between openness and growth performance is affected by a number of factors, including country, region and other attributes. Hence, some empirical findings appeared to contradict the existence of a positive link between free trade and growth. The neoclassical growth model observed no direct link with openness and economic growth (Krueger, 1997, 1998). Model explains that the sole determinant of long-run growth is the exogenously total factor productivity, which suggests that the long run economic growth cannot be influenced by the interaction with other countries. Esterly and Levine (2001) investigated and concluded that trade policies do affect growth, but to what extent it's not clear.

In the middle 1970s, there has been considerable progress in trade reforms in most developing countries, turning from import substitution strategy to export-oriented approach. Pakistan's trade policy has also been moving towards more openness; fewer control specially after 1988. Steadily the tariff rates have fall over, almost all type of quantitative restrictions except for customs duty were removed on imports. The accelerated pace of liberalization improved the trade balance significantly and Pakistan's trade deficit reduced from US$3.12 billion in 1995 to US$0.83 billion in 2003 and in 2012 over all trade deficit contracted by US$2.5 billion. In spite of various challenges faced by economy, successive trade policies attempted to diversify the export base by export infrastructure to increase exports in Pakistan. *As seen in figure 1, Pakistan's trade volume as percentage of GDP showing constant from 1960 to 2011. In figure 2 average tariff went on falling from 1972 to 2011 and international trade tax in figure 3 showing up and down trend from 1990 to 2003, after 2003 it keep constant from 1990 to 2011.*

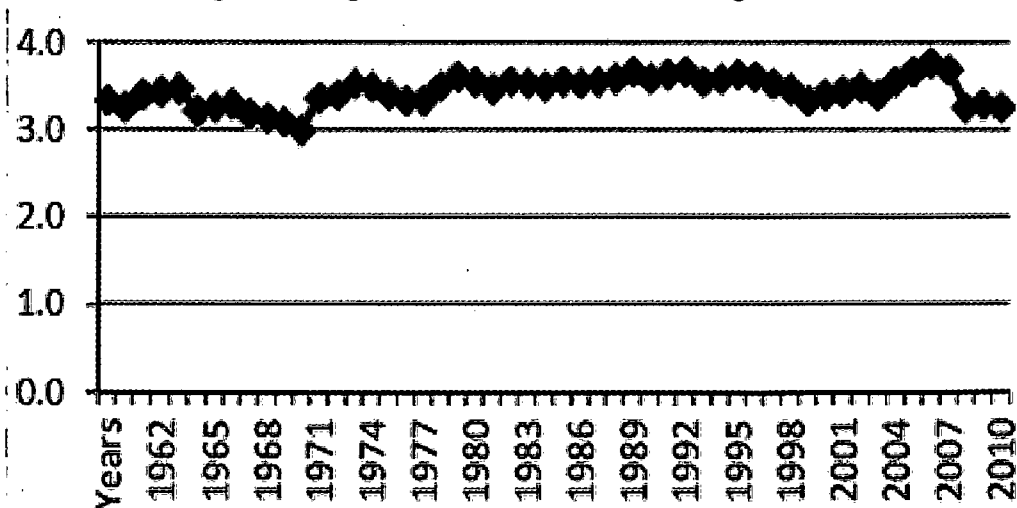### Figure 1: Log of Trade Volume as Percentage of GDP
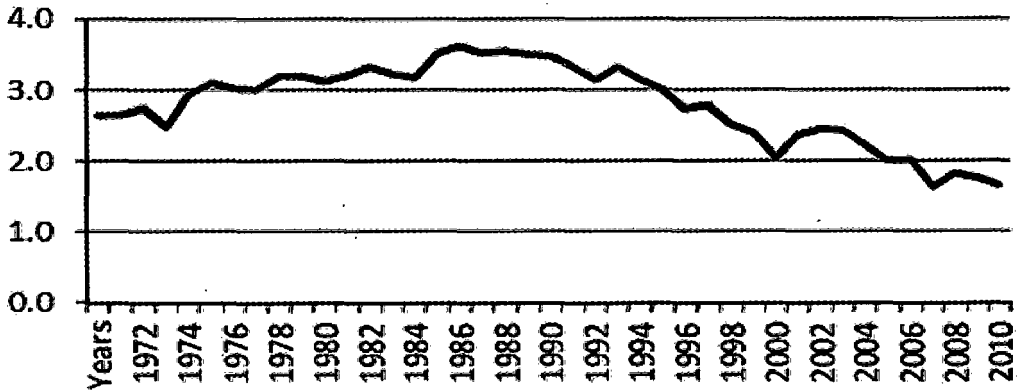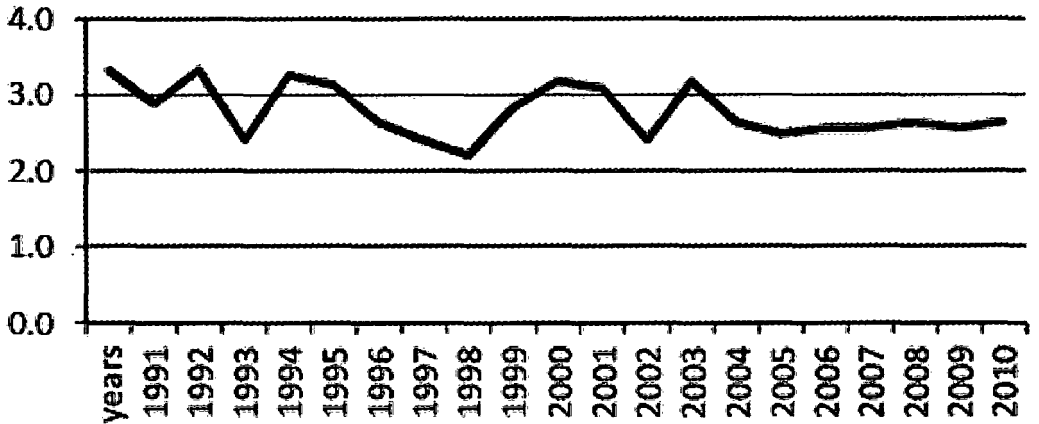
Figure 2: Log of Average Tariff rate

Figure 3: Log of Taxes on International Trade

Note: Source of figure 1, 2 and 3 is based on data obtained from WDI and author's own calculations.

Government of Pakistan in *2011* facilitated the accessibility of local business in international markets by Foreign Trade Agreements (FTAs) and Prefential Trade agreements (PTAs) with different countries. The main role of *2011-12* trade policy were to facilitate and encourage export sector by allowing import from India for export oriented textile, brown sugar industry and leather sector. In order to explore a more nuanced view, present study investigates that whether trade liberalization matter to promote economic growth in Pakistan?

It is most important to note that the theoretical and empirical growth literature discussed more about the relationship between trade policies and growth as compare to the relationship between trade volumes and growth. Therefore, the conclusion drawn from the relationship between trade barriers and growth cannot be directly comparable to the effects of changes in trade volumes on growth (Yanikkaya, 2003). Therefore, this

paper divides trade openness measures into two broad categories: measure of trade volumes and measures of trade restrictions. Even though these two concepts, trade volumes and trade restrictions, are very closely related, their relationship with growth may differ considerably. Moreover, one of the important aspects of previous studies is that they are based on cross countries regression analyses which are based on very restricted assumptions of homogeneity and same quality of data. Hence, the empirical results from cross countries studies are dubious in nature. Therefore it would be more beneficial to examine the measures of trade openness and growth based on individual country like Pakistan. The present study examines the impact of trade openness on economic growth both in the long and short run in Pakistan by using the bounds testing approach to co-integration.

The remainder of this paper is organized as follows. Section 2 discusses the brief summary of trade policy regimes in Pakistan. Theoretical and empirical literature is presented in section 3. Data sources, description of variables and Econometric methodology are discussed in section 4. Empirical results are reported in the section 5. Section 6 presents a concluding summary and some policy implications that emerge from the study.

2. Overview of Trade Policies in Pakistan

During *time of independence* and in *1950s,* import substitution strategy (IS) followed which overvalued the Rupee, after IS strategy failed in *1950s* then during *1960s,* Government of Pakistan (GoP) introduced export bonus scheme which raised manufactured exports because of that created multiple exchange rate system, the basic aim of GoP was to compensate exporters of manufactured items from *1950s* overvaluation.

In *1970s* three policy measures (devaluation of Rupee, termination of export bonus scheme and ending the licensing system) were taken to reduce anti-export biasness. Hence trade liberalization policy indicated that *1970s* measures diverted export from Pakistan to other countries, but all these measures not cut down the biasness of exports of *1970s*.

Reduction in non-tariff barriers and unfair import systems were two basic components of *1980s* import regime. Import quota and banned on capital goods was removed. The banned was imposed to protect the domestic industries and luxury items. Moreover, in order to promote the export, the fixed exchange regime had shifted to flexible regime.

In *1990s,* the Government launched tariff reforms program with an aim to increase export. The result of implementation of the tariff rate policy is ambiguous and need to visit, although tariff structure of this era was simple. In *1996-1997,* Government had

also taken tariff reform package to promote export and industrial production. The policies of 1990s helped to promote export however in the end of this era some changes were made and to cover the shortage of revenue.

The trade policy of *2000s* was to promote export culture in the country by keeping interest of Government and upper class community. The main objective of the policy was to trim down anti-export biasness by imposing banned on tariff for attaining sustainable export-led higher economic growth on the basis of market driven forces. The policy makers tried hard and specifically used exchange and monetary policy tools to support trade and to achieve more value addition in the goods and services being exported for enhancing export earnings.

In 2010 current account surplus was observed. This was possible by increasing remittances and robust growth in exports primarily because of positive terms of trade shock that overshadowed the strong growth in imports and stable exchange rate. The trade policy of *2010 era* was to facilitate export sector by export oriented textile and leather sector. The growth in exports remained broad based as almost all the groups (textile and non-textile) witnessed a high positive growth. However, lion's share of this year' exports came from textile sector and food group.

3. Literature Review.

3.1. Endogenous Growth Models in Open Economies-Theory and Evidence

Srinivasan (2001) stated there are three sources of economic growth i.e. accumulation of resources, productivity transfusion and innovation. The Heckscher-Ohlin Model explained that if there are two resources in two economies i.e. one is labour-intensive and the other is capital-intensive) then trade openness can lead to higher productivity, hence higher incomes in both countries. Krugman (1979) replied in his "new" trade theory that the total output increases as a country liberalizes its trade.

Trade openness can potentially enhance the growth prospects of a country by influencing any of these three sources of growth. For instance, an open economy can obtain factors (or their services) more easily from abroad compared to a closed economy. Trade openness also leads to better allocation of resources. When an economy opens up, forces of comparative advantage forces the economy to specialize in the sector for which it has better factor endowments. As a result, productivity of that sector goes up. The exports from that sector also increase which consequently boosts growth. Romer (1991) and Chuang (2000) also stated that trade openness increase competition that drives innovation, greater resource allocation, efficiency and technological advancement. Also openness and trade may stimulate economic expansion in some countries while reducing growth in others.

Rivera-Batiz (1995) outlines several key mechanisms through which trade and knowledge are related. The first effect is the re-allocation effect whereby the international trade can affect economic growth by reallocating resources among different sectors. The second effect of international trade is the transmission of knowledge and spillover effect. Trade restrictions reduce flows of technological information across countries and this has a negative effect on long-run growth. Third trade openness and increase competition among domestic firms and innovation dependent growth would rise. This third type of effect called the competition effect, which is linked to the issue of simulation. Here the developed economy innovates and therefore the less developed economy imitates (Grossman and Helpman, 1991).

The machinist mentioned above is incorporated with the standard neo classical production to realize a reduced form that gives trade liberalization role in growth. The Solow growth accounting technique is based on the assumption of constant returns to scale in the production function and perfect competition. Denoting output by Y, the Cobb-Douglas production function for country written as:

$$Y = F (K^{\alpha}, L^{1-\alpha}, T) \qquad\qquad 0 < \alpha < 1 \qquad\qquad (A)$$

F is a function that is homogenous of degree one in its two arguments

K symbolized by capital

L is the country's labor force

T denotes is total factor productivity or knowledge

The parameter α determines exactly how capital and labor combine to produce output.

The variable T shows that if neutral the shifts in production leave all marginal rates of substitution constant, production function looks like that:

$$Y = \{A (T) F (K, L)\} \qquad\qquad (B)$$

Where

A (T) is the technological change and stock of knowledge and it is product of the growth of K and L or investment.

If we differentiate equation 2 with respect to time and then divided by Y we obtain:

$$\frac{\Delta Y}{Y} = \frac{\Delta A}{A} + \alpha_K \frac{\Delta K}{K} + \alpha_L \frac{\Delta L}{L} \qquad (C)$$

Where,

$$\alpha_K = A \frac{\partial f}{\partial K} \frac{K}{Y}$$

And

$$\alpha_L = A \frac{\partial f}{\partial L} \frac{L}{Y}$$

These refers to differences in productivity explains most of the variation in per capita income observed across countries.

Solow showed that the production function above yields the following growth accounting identity:

$$\hat{A} = \hat{y} - \alpha_K \hat{k} - \alpha_L \hat{l} \qquad (D)$$

Where, technological change $\frac{\Delta A}{A} = \hat{A}$ is equal to the rate of growth of output $\frac{\Delta Y}{Y} = \hat{y}$ less the rates of growth in capital $\frac{\Delta K}{K} = \hat{k}$ and labor $\frac{\Delta L}{L} = \hat{l}$. This theoretical model with constant returns to scale implies that the knowledge is enhancing by economic growth i.e. labor and capital.

Inputs weighted by their output shares α_K and α_L capital and labor respectively in above equation.

Some other studies also described trade openness and growth relationship. Young (1991) described that trade liberalization between developed and less developed countries may hinder learning by doing and therefore the growth of general knowledge in developing countries. Young much argued about the trading partner countries. The model suggests that both developed and developing countries produced infinite number of goods but developing countries are labor intensive and produced the less refined goods. The produce of developed countries reflects this difference in the stock of technological knowledge. Young also explained that developed countries trade with themselves while

less developed countries trade with developing countries. This second argument of model is reflect the argument of Grossman and Helpman (1991, 1996), which described to consider dynamic comparative advantage.

Hence both theoretical and empirical work diagnose that it is difficult to observe growth and trade openness relationship in different types of trade policies hence it is still controversial.

3.2. Review of Empirical Literature

The existing empirical literature shows that the effect of trade liberalization on economic growth has four main channels; increased capital mobility, factor price equalization, knowledge spillovers and the trade-influencing technology. The effect of trade on growth can be characterized by openness influencing technological change. In this way, Afonso (2001) suggested that trade openness tends to be beneficial to growth, as it facilitates exchange of technology and enhances the flow of goods and services.

There are many studies available in the relevant literature which investigates the impact of trade openness on economic growth. For example, Edwards (1992) used data of thirty developing countries to analyze the relations between trade openness (trade intervention and distortions) and growth for a period 1970-82. He used two basic sets of trade intervention indicators in his model. The first set refers to openness and measures of trade policy tariff and Non tariff barriers which restrict imports. The second set measures trade intervention and captured the extent to which trade policy deterioted and distorted trade. His findings show that all the four openness indicators had positive effect on real GDP growth, while trade intervention indices have significantly negatively impact on GDP growth.

In a similar study for 93 developed and developing countries over the period 1960-90, Edwards (1998) examined the empirical relationship among total factor productivity growth and nine indicators of openness; and concluded that six indicators have significant impact on total factor productivity growth. However he argues that the equilibrium growth rate in the poorer economies does not depend only on openness but also on its new level of stock of knowledge and the simulation cost.

Wacziarg (2001) analyzed the association between trade policy and economic growth by taking 57 countries over the period 1970-1989. He constructed openness index with the help of three trade policy variables i.e. Tariff barrier, Non-tariff barriers and a dummy variable of liberalization. His results revealed that trade openness affects growth mainly by raising the ratio of domestic investment to GDP and FDI.

Yanikkaya (2002), used 3SLS, OLS fixed effect and SUR method for panel of 100 developed and developing countries. Findings of his study showed that trade volumes, export shares, and import shares in GDP significantly and positively correlated with growth.

Nath and Mamun (2006) investigated the causality between trade, investment and growth through Vector Auto regression (VAR) framework for the period 1971-2000 in Bangladesh. Their findings demonstrated that trade openness has promoted investment in Bangladesh.

Parikh and Stirbu (2004) used fixed effects, random effects, OLS and SURE models for panel of 42 developing countries i.e. Asia, Africa and Latin America over the period 1970-1999. They analyzed the relationship between liberalization, growth and trade balance or current account. Their findings showed that liberalization contributes significantly to economic growth, openness and investment rates.

Few many studies who depicted negative association between trade openness and economic growth like, Sarkar (2005) found no meaningful relationship between the per capita real GDP and trade openness. By employing ARDL Approach to Co-integration on two Asian countries, India and Korea, but none of the countries experienced a positive long-term relationship between trade openness and economic growth.

Harrison (1996) examined the relationship between trade restrictions and growth in developing countries using panel data for the period 1960 to 1987. He used black market premium (BMP) as a measure of trade restrictions and found a significantly negative relationship between the black market premium and growth.

Mamoon and Mursed (2006) used data of different countries which have differences in per capita income by employing instrumental technique; their study examined the importance of institutions and openness policies which is relevant to economic growth. However findings of their study showed that openness measures have insignificant impact on growth.

Kee, Nicita and Olarreaga (2009) employed trade restrictiveness indicators of Anderson and Neary (1992; 1994; 1996; 2003; 2007) research work. Their results concluded that developing countries mostly face restrictive trade policy, that's why their exports are low so economic growth also low.

4. The Data, Model and Methodology

4.1 Description of Variables and Data Sources

All the data obtained from the IFS (International Financial Statistics), the WDI (World Development Indicators) and the Economic Survey of Pakistan *various issues* for the period *1960-2011*. All variables are in *natural logarithm form* and are in US million dollars. The GDP growth rate is in percentage terms. The two kind of *trade openness* measures are used in this study such as trade volumes (Import + Export) as a share of GDP ratio and trade restrictions measures such as average tariff rates and

international trade tax. (See table 1)[2]. Other important variables which might effect growth are also included in model. Investment or gross fixed capital formation is taken in terms of GDP share or ratio and use as proxy for physical capital and years of schooling (secondary school enrolment) act as proxy for human capital. [3]

Table: 1 Measures of Openness to Trade

Name of Measure	Theory	Formula
Import Penetration rate (IP)	*Micro studies generally shows that the relationship between imports and productivity growth is often negative*	$IP = Import/(GDP + \{Import-Export\})$
Exports to Output ratio (EI)	*Empirical literature shows that only a few studies have attempted to explore the scale effects of trade liberalization on productivity growth*	$EI = E/GDP$
Price Comparisons (QR)	*Price comparisons between goods sold in the domestic and the international markets could provide an ideal measure of the impact of trade policy. In the study researchers use TOT as a proxy measure*	$QR = TOT$
Trade Flows (TF)	*This measure show a positive association with GDP growth rate*	$Imports + Exports/GDP$
Import substitution and Export promotion (IS & EP)	*This measure of openness to trade also been incorporated to account for trade liberalization impact*	$IS = 1-Import/[GDP+(import-Export)]$ $EP = Export/GDP$
Average tariff rate	*This measure show a negative association with GDP growth rate*	*Tariff rate = import revenue divide by import value*
International trade tax	*This measure show a negative association with GDP growth rate*	*Trade tax= tax on trade as a %of total total current revenue*

[2] *Sinha (2000), Wacziarg (2001), Yanikkaya (2003) and Iscan &Talan (1998) have used trade volumes as (exports + imports)/GDP as proxy of trade openness and find positive effects on growth. The trade volumes measure is not explicitly explains trade openness. Trade volume is also affected by population, transportation cost and other trading partner of the country. Therefore to capture different aspects of openness this study also uses two other trade openness measures which are tariff and trade tax. Yanikkiya (2003) used tariff rate and trade tax measure in their study but he not found evidenced that these trade barriers lower growth.*

[3] *This measure as a control variable is used by Marelli and Signorelli (2011) and Chaudry, Malik and Fridi (2010) and find positive and significant impact on economic growth. Chattergi, Mohan and Dastidar (2013) uses education expenditure as a proxy for human capital and found also find positive and significant effect on growth.*

4.2 Methodology and Model Specification

In this study ARDL bound testing approach is applied to examine the effect of trade openness measures and relevant social development indicators on economic growth.

ARDL Bound Testing Approach

Prior to test the long run co-integration relation, it is imperative to establish the order of integration among variables because in the presence of $I(2)$ or above, variables computed f-statistics are not valid [Ouattara (2004)]. For this purpose, Augmented Dickey Fuller (ADF) test is applied to test the stationary assumption for all variables under consideration. After knowing the stationarity level or order of integration of different time series, study applying the bound testing approach. Perasan, et al. (2001) introduced this new method of testing for co-integration. The main advantage of this approach lies in the fact that there is no need to classify variables into $I(1)$ or $I(0)$ as Johansen framework. The other advantages of this approach include that the variables are assumed to be endogenous and the existence of a long run relationship is investigated by estimating the following unrestricted error correction model. This technique is suitable for small or finite sample size (Pesaran et al., 2001).

The Model

In this study GDP growth (GRY) is the dependent variable is considered as the proxy of economic growth in the model[4]. The explanatory variables are tariffs and tax on trade (trade restrictions), trade volume, human capital and investment, investment works in form of fixed capital or physical capital[5]. To check the impact of all explanatory variables on the economic growth, below equation is tested:

$$M_t = \chi + \sum_{i=1}^{p} \beta_i M_{t-i} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where M_t is the vector of both X_t and Y_t, where Y_t is the dependent variable defined as economic growth (real GDP per capita growth rate), X_t is the vector matrix which represents a set of explanatory variables i.e., trade openness (OP), average tariff rate (TARIFF) and international trade tax (TAXTR), investment (I) and years of schooling (YS) and t is a time or trend variable. (All variables are in natural logs).

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[4]*See figure 10 in appendix. In figure 10 GDP growth showings up and down trend. In over all time period Pakistan GDP growth rate is worst and in 2010 it was 0.9 percent only which is very poor figure.*
    [5]*Data of average tariff rate available from 1971 and trade tax from 1990s onwards.*

This study further developed a vector error correction model (VECM) as follows:

$$\Delta M_t = \chi + \delta_t + \eta M_{t-1} + \sum_{i=1}^{k-i} \beta_i \Delta Y_{t-i} + \sum_{i=1}^{k-i} \beta_i \Delta X_{t-i} + e_t \qquad \text{................... (2)}$$

Where Δ is the first difference operator for short run coefficients. The long-run slope coefficients are η .

The slope coefficients η_t and β_t are expected to be positive and negative both, i.e.

η_t and $\beta_t \geq 0$ or ≤ 0 as in Edwards (1992, 1998), Wacziarg (2001), Clemens and Wlliamson (2001), Yanikkaya (2003), Sarkar (2005, 2008), Mamoon & Murshed (2006), Femi Saibu (2012) and Chatterji, Mohan & Dastidar (2013). This study utilized the autoregressive distributed lag (ARDL) framework by Pesaran *et al.* (2001) in Case III, that is, unrestricted intercepts and no trends. An ARDL representation of growth equation for trade openness model is given below for the above given equation 2.

Model (1)

$$\Delta(GRY)_t = \Psi_0 + \sum_{i=1}^{p} \Psi_1 \Delta(GRY)_{t-i} + \sum_{i=0}^{q} \Psi_2 \Delta(OP)_{t-i} + \sum_{i=0}^{r} \Psi_3 \Delta(I)_{t-i} + \sum_{i=0}^{s} \Psi_4 \Delta(YS)_{t-i} + \sigma_1 (GRY)_{t-1} + \sigma_2 (OP)_{t-1} +$$

$$\sigma_3 (I)_{t-1} + \sigma_4 (YS)_{t-1} + u_t \text{..(3)}$$

In the above equation the term Ψ_i with the summation signs represent the error correction dynamics whereas Δ is the difference operator while the second part [terms with σ_i in equation 3 and 4] correspond to the long run relationship and u_t is a white-noise disturbance term.

Equation (3) also can be viewed as an ARDL of order (p, q, r). Equation (3) indicates that economic growth tends to be influenced and explained by its past values. The structural lags are established by using minimum Akaike's information criteria (AIC) and Schwarz information criteria (SIC).

After estimation of Equation (3), the Wald test (*F*-statistic) was computed to differentiate the long-run relationship between the concerned variables. The Wald test can be carry out by imposing restrictions on the estimated long-run coefficients of economic growth, trade openness, investment and years of schooling. The null and alternative hypotheses are as follows:

$$H_0 = \sigma_1 = \sigma_2 = \sigma_3 = \sigma_4 = 0 \quad \text{(no long-run relationship)}$$

Against the alternative hypothesis

$H_a \neq \sigma_1 \neq \sigma_2 \neq \sigma_3 \neq \sigma_4 \neq 0$ (long-run relationship exists)

The computed F-statistic value will be evaluated with the critical values tabulated in table CI (iii) of Pesaran *et al.* (2001).

After finding the evidence of long run relationship in the model then in order to estimate the long run coefficients, the following long run model is estimated,

$$(GRY)_t = \sigma_0 + \sum_{i=0}^{r} \sigma_1 (GRY)_{t-i} + \sum_{i=0}^{r} \sigma_2 (OP)_{t-i} + \sum_{i=0}^{r} \sigma_3 (I)_{t-i} + \sum_{i=0}^{r} \sigma_4 (YS)_{t-i} + u_t \dots\dots(4)$$

In the 3rd step this study utilizes the following equation to estimate the short run coefficients:

$$\Delta(GRY)_t = \Psi_0 + \sum_{i=0}^{r} \Psi_1 \Delta(GRY)_{t-i} + \sum_{i=0}^{r} \Psi_2 \Delta(OP)_{t-i} + \sum_{i=0}^{r} \Psi_3 \Delta(I)_{t-i} + \sum_{i=0}^{r} \Psi_4 \Delta(YS)_{t-i} + \lambda ec_{t-1} + \varepsilon_t \dots\dots(5)$$

λ is the error correction term in the model indicates the pace of adjustment reverse to long run equilibrium following a short run shock, and ec_{t-1} is the residuals that are obtained from the estimated co-integration model of equation (3).

An ARDL representation of growth equation for trade tax model is given below for the above given equation 2.

Model(2)[6]

$$\Delta(GRY)_t = \Omega_0 + \sum_{i=1}^{p} \Omega_1 \Delta(GRY)_{t-i} + \sum_{i=0}^{q} \Omega_2 \Delta(TAXTR)_{t-i} + \sum_{i=0}^{r} \Omega_3 \Delta(I)_{t-i} + \sum_{i=0}^{r} \Omega_4 \Delta(YS)_{t-i} + \gamma_1 (GRY)_{t-1}$$

$$+ \gamma_2 (TAXTR)_{t-1} + \gamma_3 (I)_{t-1} + \gamma_4 (YS)_{t-1} + \psi_t \dots\dots(6)$$

In equation 6 the terms with summation signs show the error correction dynamics, while the second part (containing) correspond to the long run relationship. The existence of a long run relationship is tested by the use of F-tests. When a long run relationship exists, the F-test indicates that the variable should be normalized and long run and short run coefficients are estimated.

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[6] *In model 2 study taken trade tax, investment and years of schooling as independent variables.*

$$\Delta(GRY)_t = \Omega_0 + \sum_{i=0}^{r}\Omega_1\Delta(GRY)_{t-i} + \sum_{i=0}^{r}\Omega_2\Delta(TAXTR)_{t-i} + \sum_{i=0}^{r}\Omega_3\Delta(I)_{t-i} + \sum_{i=0}^{r}\Omega_4\Delta(YS)_{t-i} + \lambda ec_{t-1} + \xi_t \dots\dots(7)$$

$$(GRY)_t = \gamma_0 + \sum_{i=0}^{r}\gamma_1(GRY)_{t-i} + \sum_{i=0}^{r}\gamma_2(TAXTR)_{t-i} + \sum_{i=0}^{r}\gamma_3(I)_{t-i} + \sum_{i=0}^{r}\gamma_4(YS)_{t-i} + \psi_t \dots\dots(8)$$

An ARDL representation of growth equation for tariff model is given below for the above given equation 2.

Model (3)[7]

$$\Delta(GRY)_t = \omega_0 + \sum_{i=1}^{p}\omega_1\Delta(GRY)_{t-i} + \sum_{i=0}^{q}\omega_2\Delta(TARIFF)_{t-i} + \sum_{i=0}^{r}\omega_3\Delta(I)_{t-i} + \sum_{i=0}^{r}\omega_4\Delta(YS)_{t-i} + \mu_1(GRY)_{t-1}$$
$$+ \mu_2(TARIFF)_{t-1} + \mu_3(I)_{t-1} + \mu_4(YS)_{t-1} + e_t \dots\dots(9)$$

Where ω_0 is the drift component; e_t is the white noise; the terms with summation signs represent the error correction; dynamics with ω_i for example represents the short run effects; while the second part of the equations μ_i with corresponds to the long run relationship. After finding the evidence of long run relationship in the model then in order to estimate the long run coefficients, the following long run model is estimated,

$$(GRY)_t = \mu_0 + \sum_{i=0}^{r}\mu_1(GRY)_{t-i} + \sum_{i=0}^{r}\mu_2(TARIFF)_{t-i} + \sum_{i=0}^{r}\mu_3(I)_{t-i} + \sum_{i=0}^{r}\mu_4(YS)_{t-i} + e_t \dots\dots(10)$$

If the long run relationship exists among the variables, the following error correction model is estimated:

$$\Delta(GRY)_t = \omega_0 + \sum_{i=0}^{r}\omega_1\Delta(GRY)_{t-i} + \sum_{i=0}^{r}\omega_2\Delta(TARIFF)_{t-i} + \sum_{i=0}^{r}\omega_3\Delta(I)_{t-i} + \sum_{i=0}^{r}\omega_4\Delta(YS)_{t-i} + \pi ec_{t-1} + \upsilon_t \dots\dots(11)$$

The πec_{t-1} is the error correction term and the π coefficient π measures the speed of adjustment towards the long-run equilibrium. Since the study is country specific, the usual problem of data comparability, measurement issue and consistency do not arise in this case.

5.Empirical Results and Discussions

The results are reported in table 2 based on the ADF test statistic. The empirical results show that almost all variable stationary at level in both constant and constant plus trend. The underling variables such as GDP growth, tax on international trade,

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[7] *Model 3 of this study presents average tariff rate, investment and years of schooling as explanatory variables. GDP growth rate is taken as dependent variable in 1st, 2nd and 3rd model.*

trade openness and years of schooling are stationary at level. The first difference of results of ADF demonstrates that all series are stationary at 1% significance level: I(1). It is obviously from results reported in table 2, study finds mix results i.e, the mixture of both I(0) and I(1) variables. Under this condition, applying the ARDL bounds approach is most suitable technique in determining the long-run relationships among the underling variables.

Table 2: Unit Root Test

Variables	LEVEL		FIRST DIFFERENCE	
	Constant	**Constant & trend**	**Constant**	**Constant&trend**
LNGRY	-5.321*** (0)	-5.325*** (1)	-6.146*** (1)	-6.230*** (1)
LNTARIFF	-0.0079 (0)	-1.586 (1)	-7.269*** (0)	-8.288*** (0)
LNTAXTR	-4.245*** (1)	-4.595*** (0)	-7.262*** (1)	-6.990*** (1)
LNOPEN	-2.768* (2)	-2.827 (1)	-7.956*** (0)	-7.945*** (1)
LNI	-2.034 (0)	-2.815 (1)	-5.478*** (1)	-5.243*** (1)
LNYS	-3.336* (1)	-3.335* (1)	-5.261*** (1)	-5.336*** (1)

*Note: ***, **, * denotes significance at 1%, 5% and 10% respectively. The null hypothesis is that the series is non-stationary, or contains a unit root and the rejection of the null hypothesis is based on MacKinnon (1996) critical values. The standard Augmented Dickey-Fuller (ADF) unit root test was exercised to check the order of integration of these variables. The lag length is selected based on SIC criteria, this ranges from lag zero to lag two.*

The Co-integration test in the bounds' framework involves the comparison of the F-statistics against the critical values. The bounds test for Model (1) to Model (3) is presented in table 3. Using the critical value computed by Pesaran *et al.* (2001), study find that F test statistics are significant at the 1% level for model (1), (2) and (3). These results reject the null hypothesis of no co-integration, regardless of whether the variables are $I(1)$ or $I(0)$ or a mixture of both. The test also indicates the presence of valid long run relationships between the independent variables and the dependent variable except international trade tax variable (LNTRT) at the calculated F-statistic of 25.01, 18.9 and 6.04 which exceed the upper critical value. Results also show goodness of fit of the specification that is, R-squared and adjusted R-squared, is 0.59 and 0.45 for model 1, 0.96 and 0.89 for model 2 & 0.62 and 0.47 for model 3 respectively.

Table 3: Estimated Over all Models 1, 2 and 3 Based on Equation (3), (6) and (9) [(Economic Growth with Trade openness, Trade tax and Tariff rate)]

Variable	Model 1 ARDL	Variable	Model 2 ARDL	Variable	Model 3 ARDL
C	-0.694(0.781)	C	-3.149(0.174)	C	1.816(0.508)
DLNGRY(-1)	0.192(0.1001)***	DLNGRY(-1)	0.377(0.000)*	DLNGRY(-1)	-0.029(0.090)**
DLNOP	1.42(0.1000)***	DLNTRT	-0.129(0.03)**	DLNTARIFF	-0.988(0.100)***
DLNOP(-1)	0.752(0.380)	DLNTRT(-1)	-0.03(0.021)**	DLNTARIFF(-1)	-0.645(0.080)***
DLNI	1.665(0.008)*	DLNI	0.494(0.035)**	DLNI	0.338(0.072)**
DLNI(-1)	2.792(0.08)**	DLNI(-1)	2.042(0.02)*	DLNI(-1)	0.463(0.040)**
DLNYS	0.475(0.037)*	DLNYS	0.871(0.027)*	DLNYS	0.022(0.093)***
DLNYS(-1)	0.403(0.074)**	DLNYS(-1)	0.33(0.060)**	DLNYS(-1)	0.109(0.052)**
LNGRY(-1)	-0.866(0.000)*	LNGRY(-1)	0.63(0.02)**	LNGRY(-1) ·	0.781(0.004)*
LNOP(-1)	1.348(0.001)*	LNI(-1)	1.97(0.007)*	LNTARIFF(-1)	-0.142(0.056)**
LNI(-1)	2.635(0.006)*	LNTRT(-1)	-0.29(0.051)**	LNI(-1)	0.364(0.077)**
LNYS(-1)	0.619(0.056)**	LNYS(-1)	0.504(0.050)**	LNYS(-1)	0.024(0.040)**
R²	0.5903	R²	0.9605	R²	0.62778
	0.4556		0.898		0.476
F-stat [P-valuelue]	25.01[0.0068]*	F-stat[P-value]	18.83 [0.000]*	F-stat [P-value]	6.0498[0.0011]*
DW-statistic	2.1175	DW-statistic	1.8288	DW-statistic	1.9588

Note: 1., ** and *** indicate significance at 1%, 5% and 10% level respectively. () refer to p-values.*
2. The relevant critical bounds values are obtained from Pesaran et al. (2001) table C1.iii Case III (with an unrestricted intercept and no trend; with three regressors k=3) in. They are 2.72 and 3.77 at 90%, 3.23 and 4.35 at 95%, & 4.29 and 5.61 at 99%.
*3. * denotes that the f-statistic falls above the 99% upper bound.*

The coefficients of trade openness[8], investment[9] and years of schooling[10] have positive and significantly related to economic growth. While trade restrictions measures have inversely and significantly related to economic growth. The result suggests that *trade openness* acts as a lubricant in the economy creating more employment opportunities. Trade openness explores the opportunities for the domestic resources to

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[8]*Mankiw (2004) explained that trade openness through technology diffusion increases productivity which has favorable impact on economic growth. Herath (2008) study founds a significant positive relationship between trade liberalization and economic growth in Sri Lanka. Acemoglu & Zilibotti (1997) explained that the trade openness i.e. trade volumes has significantlong-run effect on economic growth because opening up capital markets for resource movement from capital abundant markets creates divergence.*

[9]*Kormendi & Meguire (1985) Barro (1991) and Levine & Renalt (1992) reported positive relationship between the investment (capital formation) and economic growth in their study. Khan and Reinhart (2008)described that investment has a larger direct effect on growth. Nejat and Sanli (1999) findings also confirm that physical capital and human capital have significant impact on explaining GDP growth for sample of developed countries.*

[10]*The findings of Barro, Sala-i-Martin and Xavier (1995), Mankiw, Romer, and Weil (1992) demonstrated encouraging impact of years of schooling on economic growth in USA. Lucas and Robert (1993) corroborated that the growth depends upon the accumulation of human capital or knowledge power and this is the basic difference between developed and developing countries. They further explained that physical capital is less important for economic growth then human capital.*

make their way into the international market. People can import the consumable products to upgrade their living standard, while the firms and industries can import technology and capital products.

Table 4: Diagnostic Checking for ARDL

	Model 1 ARDL (0, 0, 0,1)	Model 2 ARDL(0, 0, 2,1)	Model 3 ARDL(2, 2, 0, 0)
Jarque-Bera	29.465[0.000]	5.156[0.0749]	5.937[0.054]
LM Test	1.960 [0.154]	0.122 [0.734]	0.018 [0.891]
ARCH Test	0.463 [0.333]	0.511 [0.489]	0.001 [0.967];
White Heteroskedasticity	0.027 [0.303]	0.324 [0.959]	0.642 [0.816]
Ramsey Reset Test	0.611 [0.463]	0.075 [0.783]	0.991 [0.327]

Notes: Jarque-Bera is the normality test which is based on a test of skewness and kurtosis of residuals, Breusch-Godfrey Serial Correlation LM used to test for the presence of serial Autocorrelation. ARCH test, Based on the regression of squared residuals

The robustness and goodness of the ARDL model has been examined by several diagnostic tests such as Jarque-Bera, Breusch- Godfrey serial correlation LM test, ARCH test, White Heteroskedasticity and Ramsey RESET specification test.

Table 4 shows that model 1, 2 and 3 generally pass the several diagnostic tests such as Jarque-Bera, Breusch-Godfrey serial correlation LM test, ARCH test, White Heteroskedasticity and Ramsey RESET specification test. These tests reveal that the models have achieved desire econometric properties, that is there is no evidence of autocorrelation, it has a correct functional form, error is normally distributed and homoskedastic. These models show that these models have the best goodness of fit of the ARDL model and valid for reliable interpretation.

Finally, when analyzing the stability of the long–run coefficients together with the short-run dynamic model, the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residual (CUSUMSQ) are applied. According to Pesaran and Pesaran (2001), the stability of the estimated coefficients of the models should be empirically investigated. A graphical representation of CUSUM and CUSUMSQ statistics are shown in Appendix (figure 1 to 6). It is clear from Appendix, that the plots of both the CUSUM and the CUSUMSQ are within the boundaries except trade openness and hence these statistics confirm the stability of the long-run coefficients of the trade tax, tariff rate, investment, years of schooling and economic growth in ARDL models.

Long-run and short-run estimations

Under the analysis of ARDL, the existence of the long run coefficients of Equation 3 to Equation 11 [or model (1) to model (3)], are estimated and the results are reported in table 6. In order to select the best performing ARDL-model, the significance of the resulting ARDL-VECM parameters, the Schwarz information and Akaike information Criterion is used in the study. The Schwarz information and Akaike information Criterion lag specifications for model (1) to model (3) are shown in table 3. For these three models, the optimal numbers of lags for each of the variables are ARDL (0, 0, 0, 1), ARDL (0, 0, 2, 1) and ARDL (2, 2, 0, 0) respectively.

Table 5: ARDL Model Long-run Results

Regressor	Model 1 ARDL(0, 0, 0, 1)	Regressor	Model 2 ARDL (0, 0, 2, 1)	Regressor	Model 3 ARDL (2, 2, 0, 0)
	C -0.185(0.931)	C	2.785(0.03)**	0.920(0.806)	C
LNOP	1.278(0.007)*	LNTRT	-0.189(0.096)***	LNGRY(-1)	0.640(0.090)***
LNI	0.751(0.009)*	LNI	0.914(0.09)**	LNGRY(-2)	0.895(0.030)**
LNYS	2.009(0.100)***	LNI(-1)	2.080(0.193)	LNTARIFF	-1.112(0.0214)**
LNYS(-1)	1.927(0.001)*	LNI(-2)	2.499(0.101)***	LNTARIFF(-1)	-0.318(0.0627)***
		LNYS	1.493(0.089)***	LNTARIFF(-2)	-0.577(0.028)**
		LNYS(-1)	1.0132(0.100)***	LNI	0.310(0.064)***
				LNYS	0.037(0.085)***

.*Note: *, ** and *** point out significance at 1%, 5% and 10% level respectively, () refer to p-values*

The long run results show that the estimated coefficients are expected to be significant in model 1; it shows the long-run relationship exists among real GDP growth rate, trade openness, investment and years of schooling. If there is one percent increase in trade openness, investment and years of schooling so economic growth increases by 1.27, 0.75, 2.009 and 1.9 percent respectively. This analysis demonstrates that in long-run trade openness, investment activities and years of schooling[11] have positive and significant effects on economic growth of Pakistan. This may imply that trade openness policies enhance the trade flows in Pakistan.

The long run model (2) in table 5 shows that international trade tax[12] coefficient

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[11]*Abdullah, Mustafa and Habibiullah (2009) reported that trade openness, education expenditure and physical capital (investment) has favorable impact on economic growth in Malaysia. Their study suggests that growth impact of trade openness is beneficial when economy faces more competition and thus stimulates productivity. See Krueger (1998) 'Why Trade Liberalization is good for economic growth' article for further information.*

[12]*Chattergi, Mohan and Dastidar (2012) use also international trade tax as a measure of trade barriers in their study of India and found insignificant results due to non availability of the data. Read Rodriguez and Rodrik (2001) study also for critiques and weaknesses of trade barriers measures.*

is negative and statistically significant, while investment (LNI) and second lag of investment (LNI (-2)) are positive and statistically significant. Years of schooling (LNYS) and first lag of years of schooling (LYS (-1)) coefficient have positive and statistically significant impact on economic growth. These results highlight the importance of education and domestic investment in the growth process of Pakistan. The negative and significant effect of international trade tax in the long run model corroborates that the trade tax creates hurdle in the growth rate of Pakistan. This suggests that trade tax should be removed in order to enhance growth.

According to empirical results of model 3, first and second lag of economic growth, investment and years of schooling have positive sign has a positive and statistically significant impact on economic growth. This indicates that the one percent increase in the first lag (LNGRY (-1), second lag of GDP growth (LNGRY (-2), investment (LNI) and years of schooling (LNYS) in Pakistan leads to 0.64, 0.89, 0.3 and 0.03 percent current GDP growth. But tariff rate has a negative and statistically significant impact on economic growth.

Table 6: Short-run Model Results

Regressor	Model 1 ARDL (0, 0, 0, 1)	Regressor	Model 2 ARDL (0, 0, 2, 1)	Regressor	Model 3 ARDL (2, 2, 0, 0)
C	0.010(0.11)	C	0.0293(0.25)	C	0.097(1.18)
DLNOP	0.698(0.31)	D(LTRT)	-0.319(-2.38)*	DLNGRY(-1)	0.057(0.28)
DLNI	0.266(1.71)***	D(LINV)	1.038(1.40)	DLNGRY(-2)	0.108(0.588)
DLNYS	0.304(1.77)***	DLINV(-1)	0.651(2.16)**	DLNTARIFF	-0.962(-2.060)**
DLNYS(1)	0.604(3.14)*	DLINV(-2)	1.717(0.95)	DLNTARIFF(-1)	-0.518(-1.05)
Ecm(-1)	-0.765(-5.11)*	D(LYS)	0.561(2.86)*	DLNTARIFF(-2)	-0.699(-1.53)
		DLYS(-1)	0.891(1.40)	DLNI	0.129(0.185)
		Ecm(-1)	-1.012(-2.85)*	DLNYS	0.022(0.131)
				Ecm(-1)	-0.672(-2.62)*

*Note: *, ** and *** indicate significance at 1%, 5% and 10% level respectively, () refer to t-values*

Table 6 reports the short run dynamics of the second part of the MacKinnon-Shaw hypothesis. The dynamic short-run results reveals that the coefficient of Ecm (-1) is -0.765512, which is highly statistically significant. It implies that the disequilibrium occurring due to a shock is totally corrected in next year at a rate of about 76%. The results suggests that investment and years of schooling have statistically positive and significant effect on economic growth in short run while trade openness measures have insignificant impact on economic growth in short run

Model (2) reports that the error correction terms are negative and statistically significant as expected. The error correction terms coefficient Ecm (-1) are reasonably high i.e. 1.01% which indicates a high speed of readjustment to long run equilibrium from short run disturbance to the model. The international trade tax coefficient is negative and statistically significant similarly coefficient of change in lag investment i.e. DLINV (-1) and change in years of schooling i.e. DLYS are 0.65 and 0.56 which is positive and statistically significant. It suggests that in short run an increase of 1% in change in lag of investment and change in years of schooling is associated with an increase in 65 and 56 percent in economic growth. This short run result therefore suggests that lag in investment and years of schooling have significant positive effects on economic growth in the short run. So lags of investment and years of schooling in the short run could be growth enhancing.

Model (3) demonstrates that the coefficient of lags of economic growth (DLNGRY (-1), DLNGRY (-2)), lags of tariff rate (DLNTARIFF (-1), DLNTARIFF (-2)), change in investment (DLNI) and change in years of schooling (DLNYS) are not significant in the short run. Coefficient of DLNTARIFF reveals that an increase in the 1% in the average tariff rate is related with 0.96 percent decline in economic growth. The coefficient of error correction terms is (-0.67) which is negative and statistically significant, indicating that 67 percent discrepancy in the short span is adjusted in the long run every year. Change in lags of economic growth, change in investment and change in years of schooling are not statistically significant. So in the short run economic growth cannot enhance by increasing investment activity, years of schooling and lags of economic growth.

6. Conclusion and Policy Implications

The objective of this present study is to examine the impact of trade openness on economic growth both in the long and short run in Pakistan by using the bounds testing approach to co-integration .The findings suggest that trade liberalization policies play key role to enhance economic growth in Pakistan. This is consistent with the prediction of most international trade theories that trade openness is an important engine for economic growth. The effect of trade volume on growth became significant from 1980 onwards when Pakistan gradually moves towards new tariff reform policy for industrial sector growth. Pakistani industries started importing raw materials and intermediate goods after tariffs reduction which increased labor productivity and consequently led to faster economic growth (see Ashfaque Hasan 2000). Moreover, study also finds that an increase in physical capital and human capital leads to an increase in GDP growth rate of Pakistan. Government should take action to enhance physical and human capital in order to promote economic growth of the country. The rapid rate of skilled labor emigration, mainly due to unstable law and order situation, is having a deleterious effect on Pakistan's human resources. The stable political and economic environment encourages domestic investment as well as foreign investment in Pakistan. Another

significant finding is that trade restrictions measures had adverse effects on growth in long run; this indicates that Pakistan's economic growth was partially the result of the government's open policies.[13] However, the insignificant coefficient of openness trade polices might indicate that openness trade policies may not necessarily generate economic growth in the short-run. The policy implications about sustainable and protracted openness policy are desirable for countries to get the benefits of openness. Therefore, developing countries like Pakistan need to consider trade open policy as a long term plan of the country. Considering the findings of the study, the policy direction of Pakistan should emphasize on more liberal policies, with emphasis on how and when openness is actually important.

Acknowledgements

Appendix

Plot of CUSUM and CUSUMQ (stability test)
Model 1: Economic Growth with Trade Openness (Equation 3)

Figure 4: Cusum

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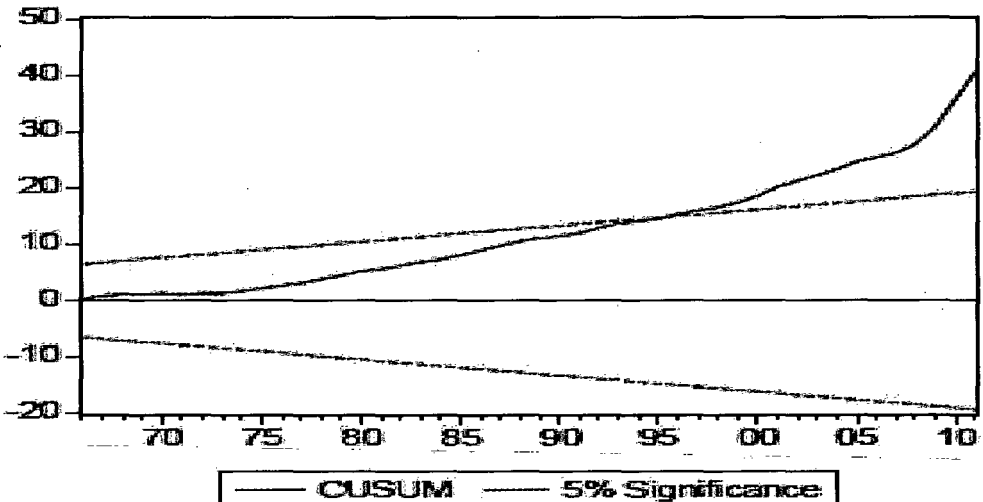
[13] *Ahmad, Mohsin H (2004) finding suggest that the integration of the Pakistan economy with the world economy attract more FDI. The size of FDI inflows in Pakistan was not significant until 1991 due to the regularity policy framework and growth impact of FDI tends to be greater under an export promotion trade regime compared to an import-substitution.*
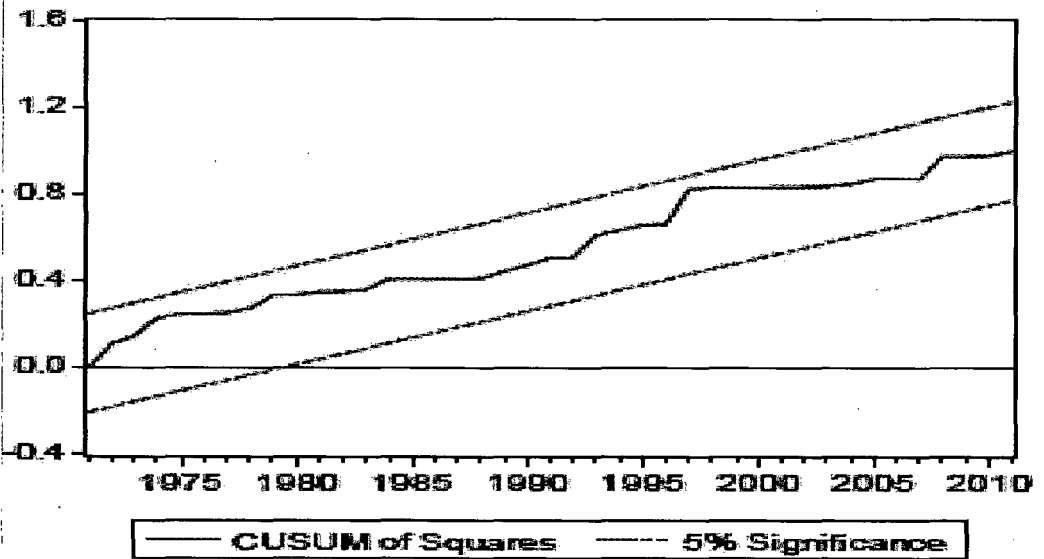
Figure 5: CusumQ

Figure 4 and 5: The dotted lines represent critical lines while wavy line shows cusum and cusum q

Model 2: Economic Growth with International Trade Tax (Equation 6)
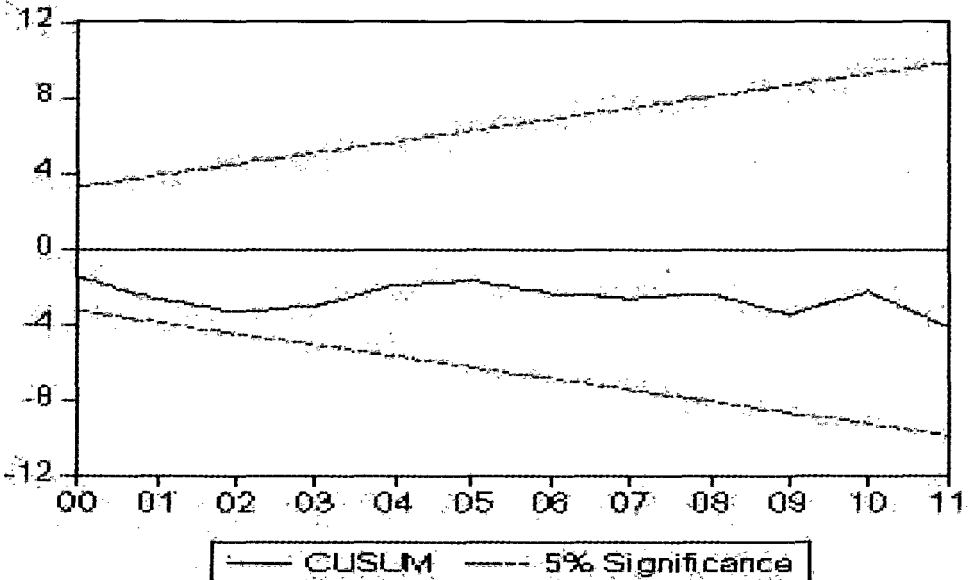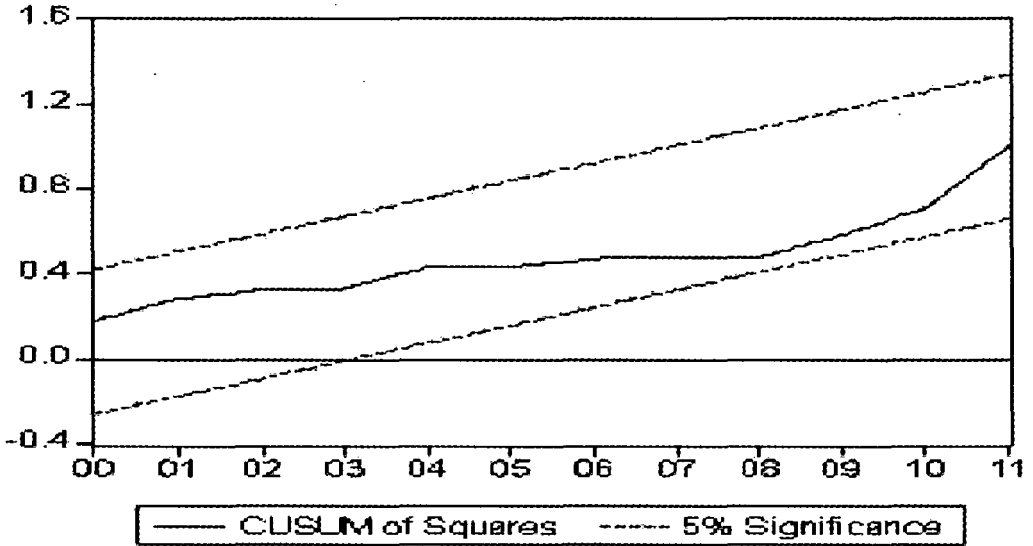
Figure 6: Cusum

Figure 7: CusumQ

Figure 6 and 7: The dotted lines represent critical lines while wavy line shows cusum and cusum q

Model 3: Economic Growth with Tariff rate (Equation 9)
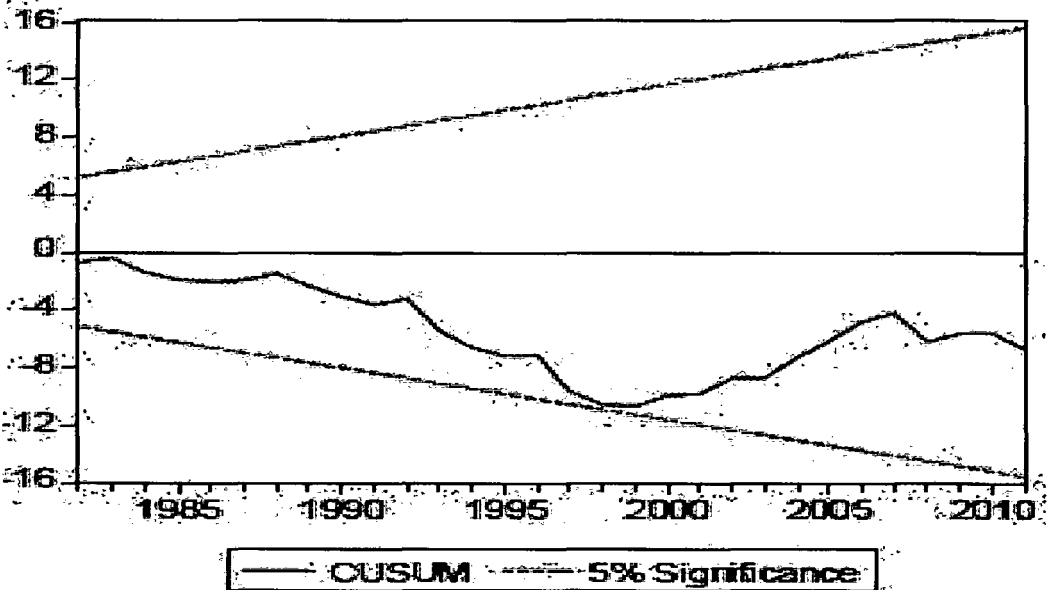
Figure 8: Cusum
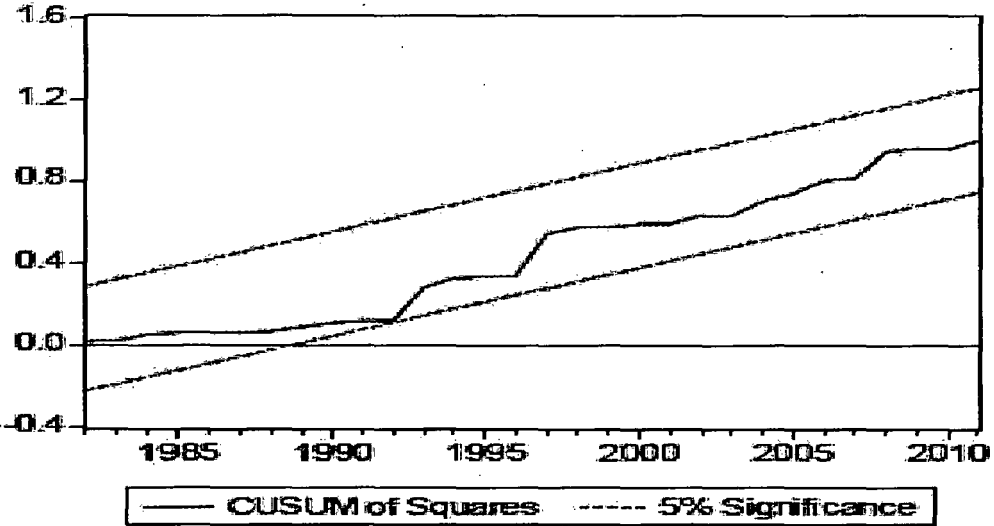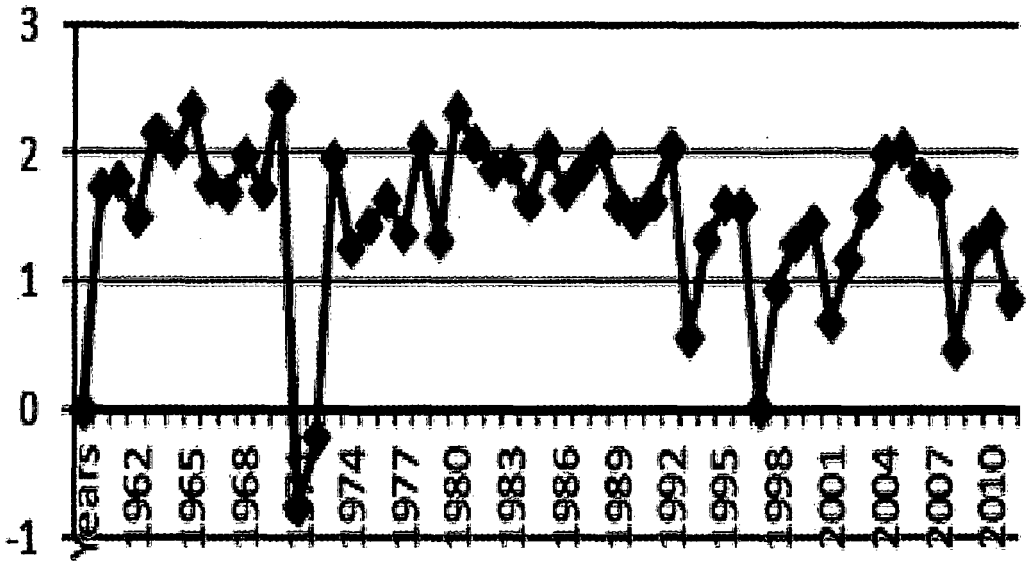
Figure 9: CusumQ

Figure 8 and 9: The dotted lines represent critical lines while wavy line shows cusum and cusum q

Figure 10. Log of GDP Growth Rate

Source: Author's own calculations based on data obtained from WDI.

References

Afonso Oscar (200 J), "The Impact of International Trade on Economic Growth", FEP Working Papers J06, UlllversJdade do Porto, Faculdade de Economia do Porro.

Ahmad, Mohsin Hasnain., and Zeshan Atiq. (2004).the impact of FDI on economic growth under foreign trade regimes: a case study of Pakistan. *Pakistan Development Review*, Vol.43.707-718.

Anderson, J. and Neary, P. (1992). _Trade reforms with quotas, partial rent retention and tariffs Econometrica, vol. 60(1), pp. 57–76.

Anderson, J. and Neary, P. (1994). _Measuring the restrictiveness of trade policy, World Bank Economic Review, vol. 8(2) (May), pp. 151–69.

Anderson, J. E. and Neary, P. J. (1996). 'A new approach to evaluating trade policy, Review of Economic Studies, vol. 63, pp. 107–25.

Anderson, J. E. (1998). 'Trade restrictiveness benchmarks', Economic Journal, vol. 108, pp. 1111–25.

Anderson, J. and Neary, P. (2003). _The Mercantilist index of trade policy, International Economic Review, vol. 44(2) (May), pp. 627–49.

Anderson, J. and Neary, P. (2005). Measuring the Restrictiveness of Trade Policy, Boston: MIT Press.

Anderson, J. and Neary, P. (2007). _Welfare versus market access: the implications of tariff structure for tariff reform, Journal of International Economics, vol. 71(2) (March), pp. 627–49.

Badinger, H. (2001), 'Growth effects of economic integration – the case of the EU member states (1950–2000)', Working paper.

Balasubramanyam, V.N., Salisu, M., & Sapsford, D.(1996). Foreign Direct Investment and Growth in EP and IS Countries. The Economic Journal, 106 (434), 92-105.

Baldwin, R.E. and Forslid, R. (1998), Trade and growth: Any unfinished business?, European Economic Review 42, 695–703

Ben-David, D. and Loewy, M. (1998), Free trade, growth and convergence, Journal of Economic Growth 3, 143–170.

Baumol, William. J., Nelson, R.R., & Wolf, E.N. (1994). Convergence of Productivity: Cross National Studies and Historical Evidence. New York: Oxford University Press.

Blomstrom, M., Robert, E., Lipsey, R., & Mario, Z. 1996. Is fixed investment the key to economic growth? Quarterly Journal of Economics, 111(1), 269-276.

Brock, W. A. and Durlauf, S. N. (2001). 'Growth empirics and reality', The World Bank Economic Review, vol. 15 (2), pp. 229–72.

Bayoumi, T., D.T. Coe, and E. Helpman, "R&D Spillovers and Global Growth," *Working Paper* no. 5628, National Bureau of Economic Research, June 1996.

Chatterji, Mohan and Dastidar (2013), Relationship between trade openness and economic growth of India: A time series analysis,Working Paper No. 274 ISSN: 1473-236X presented at Economic Studies, University of Dundee.

Dollar, D., (1992), Outward-oriented developing economies really do grow more rapidly: Evidence from 95 LDCs, 1976–1985, Economic Development and Cultural Change 40, 523–544.

Dollar, D. and Kraay, A. (2001), 'Trade, Growth, and Poverty', Mimeo.

Easterly, W. and Levine, R. (2001). 'It's not factor accumulation: stylised facts and growth models', The World Bank Economic Review, vol. 15 (2), pp. 177–220.

Edwards S (1992), Trade Orientation, Distortions and Growth in Developing Countries, J Development Economics, 39:31-57.

Edwards, S. (1998). Openness, productivity and growth: What do we really know? Economic Journal, 108(447): 383-398.

Edwards, Sebastian, "Openness, Trade Liberalization, and Growth in Developing Countries," *Journal of Economic Literature* 31 September 1993, pp. 1358-1393.

Emery, R. F (1968), The relation of exports and economic growth: A reply. *Kyklos*, vol. xxi, no. 4: 15–29.

Easterly, W. & Kraay, A. (2000). Small states, small problems? Income, growth, and volatility in small states. World Development, 28 (11), 2013–2027.

Frankel. J. (1992), Measuring International Capital Mobility: A Review, American Economic Review 82:197-202.

Frankel, J. A. and Romer, D. (1999). 'Does trade cause growth?', American Economic Review, vol. 89 (3) (June), pp. 379–99.

Frankel, J. and Rose, A. K. (2002). 'An estimate of the effect of common currencies on trade and growth', Quarterly Journal of Economics, vol. 117 (469), pp. 437–66.

Frankel, Jeffrey and David Romer, "Trade and Growth: An Empirical Investigation," *NBER Working Paper*, no. 5476, Cambridge, MA: National Bureau of Economic Research, March 1996.

Hamon Shlgeyuki and Razafimahefa Jvohasina F (2003), 'Trade and Growth Relationship' Some Evidence from Comoros, Madagascar, Mauritius and Seychelles", http: www,dsdfas.kyoto-u.acJp/asafbook/pdfjno_03/pl74_185.pdf

Hanson, G. and Harrison, A. (1999). 'Who gains from trade reform? Some remaining puzzles', Journal of Development Economics, vol. 59 (1), pp. 125–54.

Harrison, A. (1996). 'Openness and growth: a time-series, cross-country analysis for developing countries', Journal of Development Economics, vol. 48 (2), (March), pp. 419–47.

Irwin, D. A. and Tervio, M. (2002). 'Does trade raise income? Evidence from the twentieth century', Journal of International Economics, vol. 58 (1), pp. 1–18.

Kendrick, J.W. (1993). How much does capital explain? In A. Szirmai, B. Van Ark & D. Pilat (Eds.), Explaining Economic Growth. Essays in Honour of Angus Maddison. Amsterdam: North Holland. 129-146.

Krichel T and Levine P (2002), "The Economic Impact of labour Mobility in an Enlarged European Union", University of Surrey.

Krieckhaus J (2002), Reconceptualizing the developmental state: public savings and economic growth, World Development, 13(10), 1697-1712.

Levine, R and D. Renelt (1992), "A Sensitivity Analysis of Cross -Country Growth Regressions." *American Economic Review*, September 1992.

Levine, Ross and David Renelt, "A Sensitivity Analysis of Cross-Country Growth Regressions," *American Economic Review* 82:4 September 1992, pp. 942-963.

Levin, A. and Raut L. (1997), 'Complementarities between exports and human capital in economic growth: evidence from the semi-industrialized countries', Economic Development and Cultural Change,46(1), 61–77.

Mamoon and Murshed (2006). "Trade policy, openness and institutions. The Pakistan Development Review.

Matin, K. M. (1992). Openness and economic performance in sub-Saharan Africa: Evidence from time series cross-country analysis. Washington, D.C: World Bank.

Ouattara (2004), "Modelling the Long Run Determinants of Private Investment in Senegal"Centre for Research in Economic Development and International Trade, University of Nottingham.

Pesaran MH, Shin Y, Smith RJ (2001) Bounds testing approaches to the analysis of level relationships. J Appl Econom 16:289–326

Rodriguez, F. and Rodrik, D. (2000). 'Trade policy and economic growth: a skeptic's guide to the crossnational evidence', in (B. Bernanke, and K. S. Rogoff, eds.), Macroeconomics Annual 2000. pp. 261– 324, Cambridge, MA: MIT Press for NBER.

Romer, P. M. (1989).What determines the rate of growth and technological change. World Bank Working Paper, 279.

Romer, D. and Frankel, Jeffery, A. "Does Trade Cause Growth?", *The American Economic Review,* Vol. 89, No. 3 (Jun., 1999), pp. 379-399

Romer, D. (1993), "Openness and Inflation: Theory and Evidence" *The Quarterly Journal of Economics,* Vol. 108, No. 4 (Nov., 1993), pp. 869-903.

Romer, P. (1994). 'New goods, old theory and the welfare cost of trade restrictions', Journal of Development Economics, vol. 43 (1), pp. 5–38.

Rutherford, T.F. and Tarr, D.G. (2003), 'Trade Liberalization, Product variety.

Sarkar, Prabirjit (2007), Trade Openness and Growth: Is There Any Link? Online at http://mpra.ub.uni-muenchen.de/4997/ MPRA Paper No. 4997, posted 07. November 2007 / 04:22

Strydom PDF (2003), "International Trade and Economic Growth in South Afrjci:1", *The* Economic Society of South Africa.

Uwat, B. U 2004 Globalisation and Economic Growth: The African Experience. The Nigeiran Economic Society

Wacziarg, Romain, "Dynamic Gains from Trade in Seven Lessons," typescript, September 1996, (Cambridge, MA: Harvard University).

Wacziarg, R. (2001). 'Measuring the dynamic gains from trade', World Bank Economic Review, vol. 15 (3), pp. 393–429.

Yanikkaya, H., (2003). Trade openness and economic growth: A cross- country empirical investigation. *Journal of Development Economics*, 72(1), 57-89

Young, A., (1991), Learning by doing and the dynamic effects of international trade, Quarterly Journal of Economics 106(2), 369–406.

Young, A. (1992), 'A tale of two cities: Factor accumulation and technical change in Hong Kong and Singapore', NBER Macroeconomics Annual, 13–63.